SERVICE MANUAL SUPPLEMENT

Use this Service Manual Supplement in conjunction with Service Manual F-24641.

VEC ELECTRIC CONVEYOR OVENS

8260

MODEL	ML
VEC3018	
10KW	ML-136013
15KW	ML-136014
VEC4018	ML-136015

- NOTICE -

This Manual is prepared for the use of trained Vulcan Service Technicians and should not be used by those not properly qualified. If you have attended a Vulcan Service School for this product, you may be qualified to perform all the procedures described in this manual.

This manual is not intended to be all encompassing. If you have not attended a Vulcan Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Vulcan Service Technician.

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GENERAL

INTRODUCTION

Conveyor Pizza Oven Models VEC3018 and VEC4018 have been redesigned with the following changes.

1. Tubular type coil heat elements.
2. Heat element access is different.
3. High limit temperature control incorporates time delay to keep main blower running to help remove overheat temperature.
4. High limit temperature probe relocated.
5. Temperature probe relocated.
6. Operator Speed control board is different.
7. Top and bottom air distribution panels redesigned.

The new ML numbers for these ovens are:

ML-136013 for Model VEC3018 10KW oven.

ML-136014 for Model VEC3018 15KW oven.

ML-136015 for Model VEC4018 oven.

The starting serial number for units with the new components is CP1000537.

REFERENCE MATERIAL

Refer to Service Manual F24641 when servicing components other than those covered in this manual.

Refer to Catalog of Replacement Parts F31164A which includes the new parts discussed in this manual.

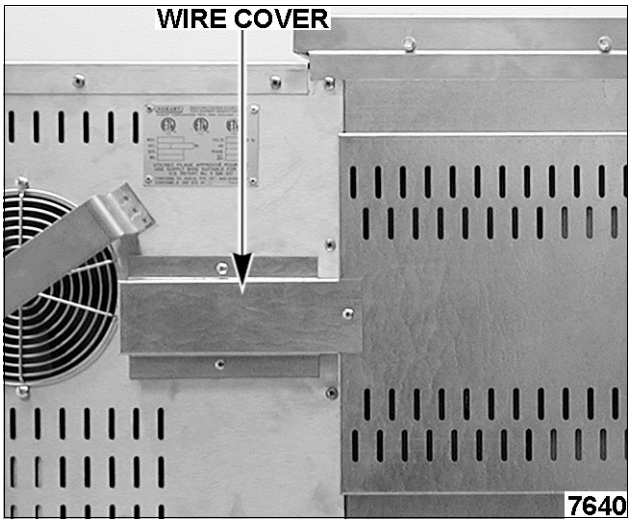
Refer to the Instructions Manual included with each unit for detailed operation and cleaning information.

REMOVAL AND REPLACEMENT OF PARTS

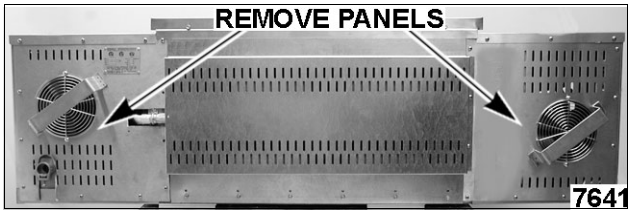
HEAT ELEMENTS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

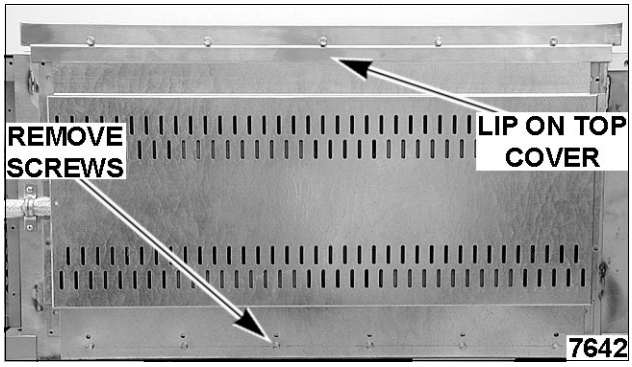
1. Remove heat element wire cover.



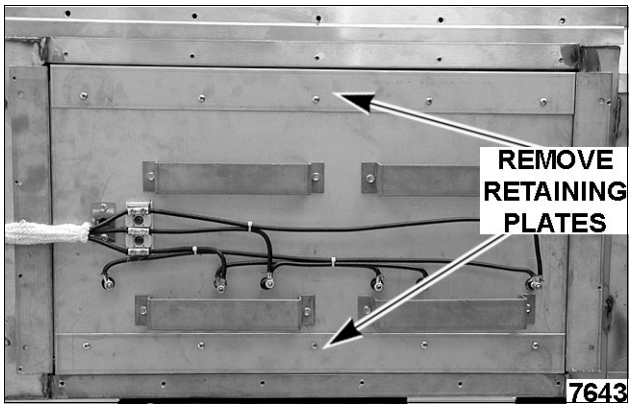
2. Remove the control housing and motor housing back panel.



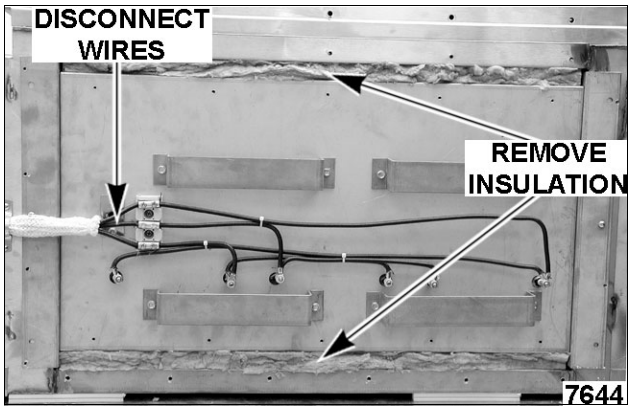
3. Remove screws from bottom of rear oven panel.
   A. Remove panel by sliding and lowering top out from under oven top cover lip.



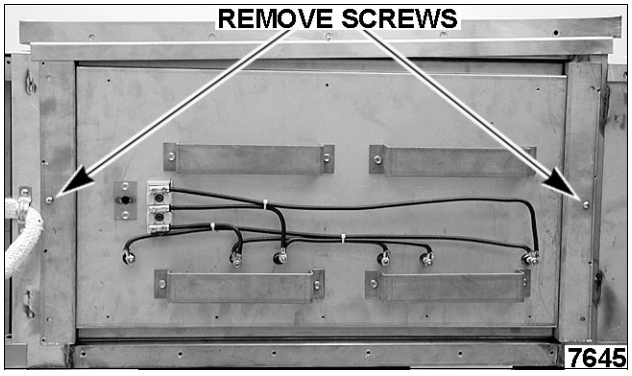
4. Remove screws securing rear of oven top cover.
   A. Lift rear of top cover and slide cover about 1" towards front of oven. Let cover rest on top of oven.
5. Remove screws securing two retaining plates and remove plates.



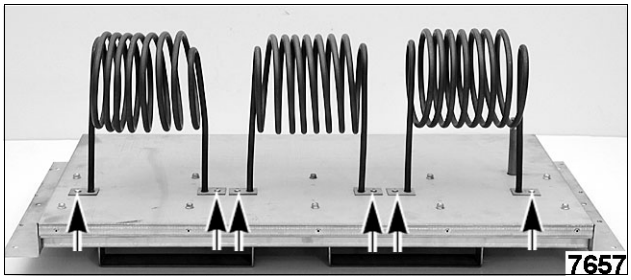
6. Remove insulation.
7. Disconnect element supply wires at terminal strip.



8. Remove screws and carefully pull out element tray.



9. To replace elements, disconnect wires then remove screws securing the element.



10. Reverse procedure to install.

AIR DISTRIBUTION PANELS

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

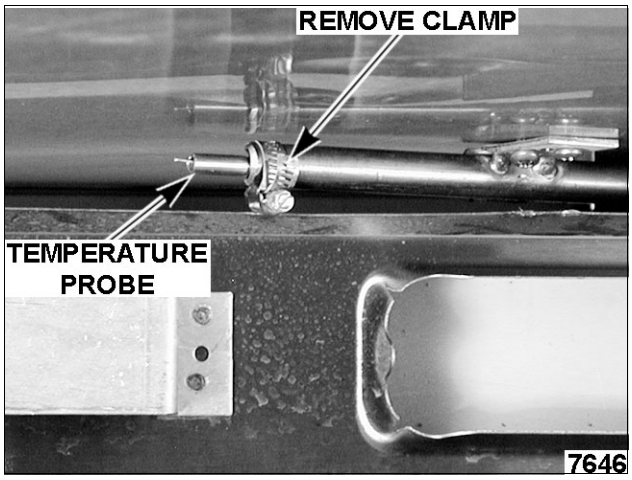
1. Remove the front panel by lifting up on the panel handle, then pull out on the bottom of the panel.
2. If removing the bottom air distribution panel, remove the crumb tray.
3. Pull air distribution panel locking pins inward to unlock panel from oven sidewalls.
4. Pull air distribution panel out of oven.

5. Reverse the procedure to install.

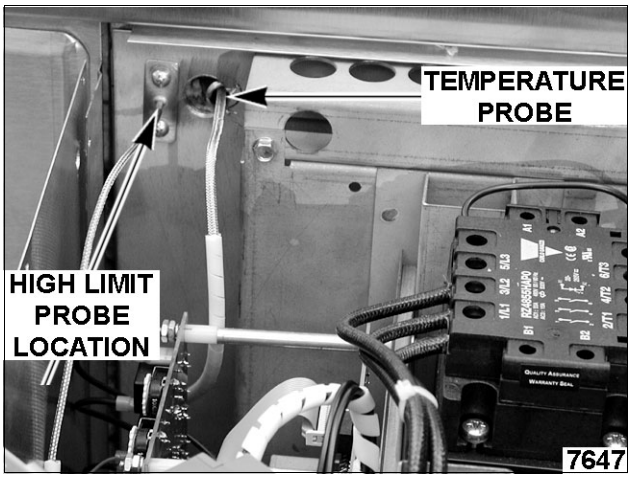
TEMPERATURE PROBE

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

1. Remove the top cover from the control housing.
2. Remove the back panel from the housing.
3. Remove the remaining section of the control panel housing.
4. Remove the top air distribution panel as outlined under AIR DISTRIBUTION PANELS.
5. Remove the clamp from the probe routing tube.



6. Remove probe from routing tube by pulling probe out of tube.

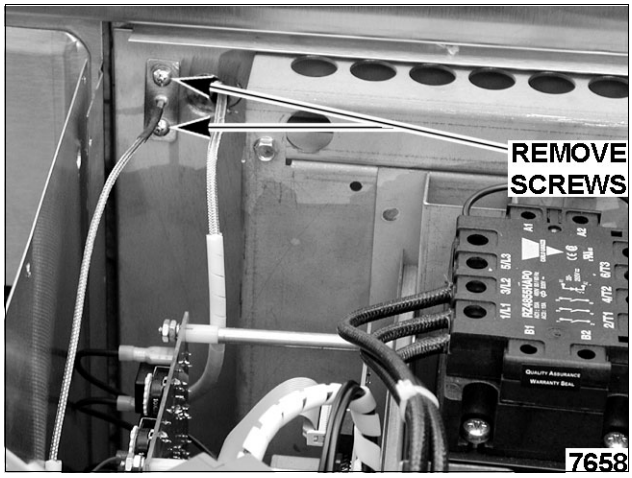


7. Disconnect probe from controller.
8. Reverse the procedure to install the new probe.

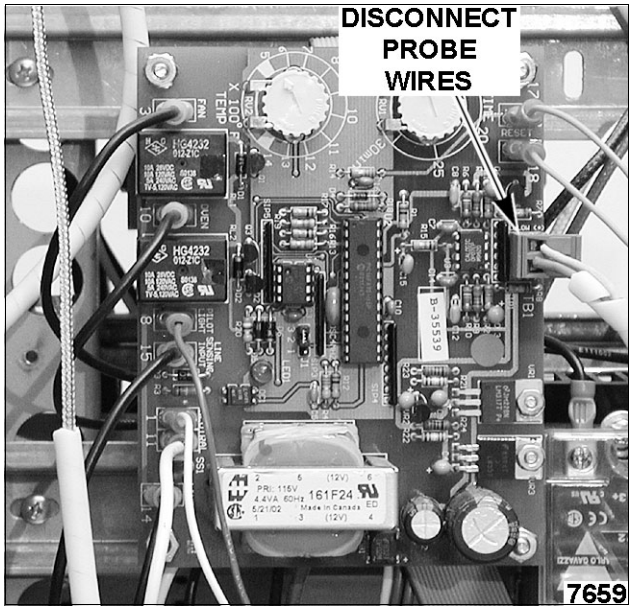
HIGH LIMIT TEMPERATURE PROBE

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

1. Remove the top cover from the control housing.
2. Remove the back panel from the housing.
3. Remove the remaining section of the control panel housing.
4. Remove screws securing probe.



5. Disconnect probe wires at high limit control.



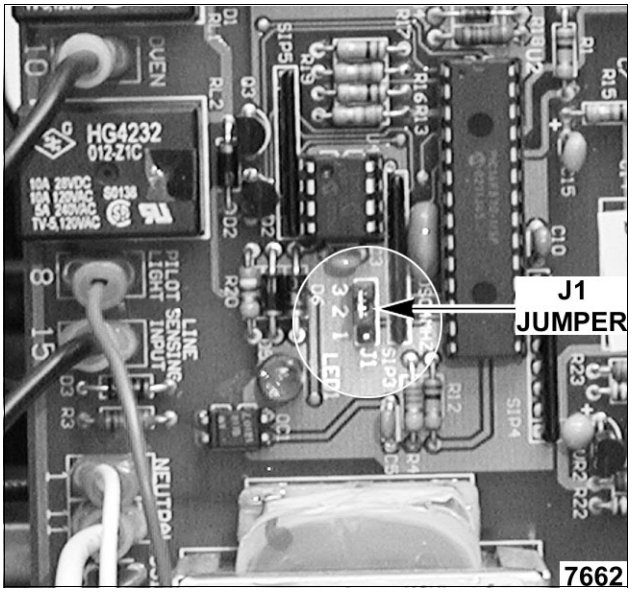
6. Reverse the procedure to install the new probe.

HIGH LIMIT CONTROL

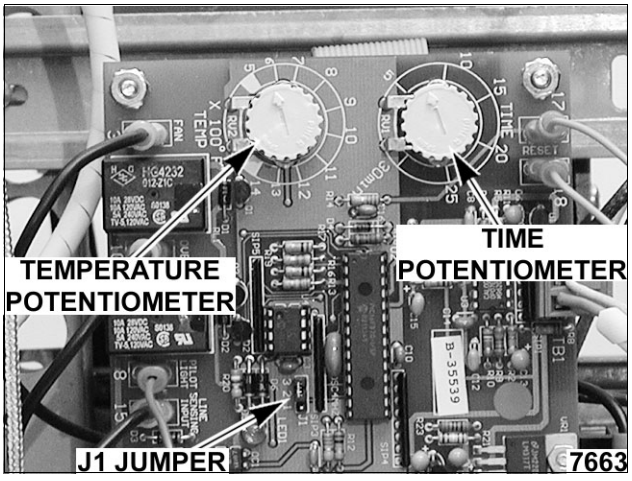
WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

CAUTION: Certain components in this system are subject to damage by electrostatic discharge during field repairs. A field service grounding kit is available to prevent damage. The field service grounding kit must be used anytime the control board is handled.

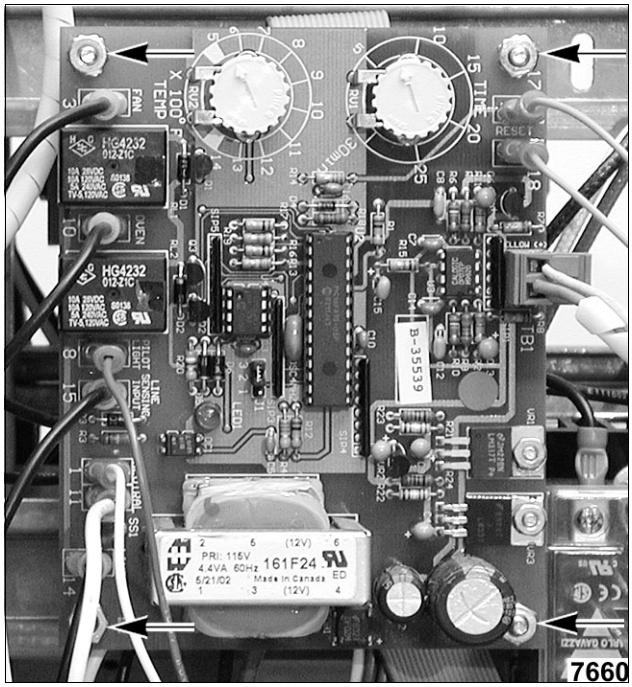
1. Remove the top cover from the control housing.
2. Remove the back panel from the housing.
3. Remove the remaining section of the control panel housing.
4. Check that J1 jumper is located on pins 2 and 3 on replacement control board. If it was not on pins 2 and 3, you must reset temperature and time settings in SERVICE PROCEDURES AND ADJUSTMENTS.



5. Rotate temperature and time potentiometers on replacement board so that arrows are in approximately same position as old control board (potentiometers may have been moved during packaging and are inoperative with J1 jumper on pins 2 and 3. You are merely referencing their position.)



6. Identify and disconnect wires from high limit control.
7. Removes nuts securing high limit control board and remove board.



8. Reverse the procedure to install.

NOTE: No adjustment is required, however, if J1 jumper was on pins 1 and 2 or missing altogether when you unpacked the high limit control, go to SERVICE PROCEDURES AND ADJUSTMENTS to reset potentiometers.

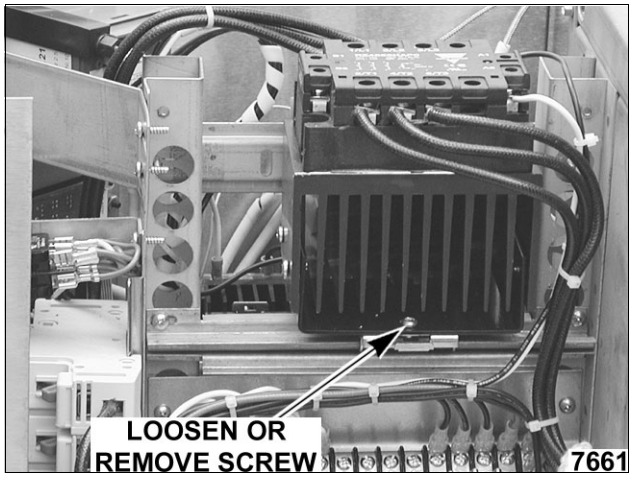
NOTE: If customer prefers a different time from the factory setting of approximately 5 minutes for blower to run after high limit trips, go to SERVICE PROCEDURES AND ADJUSTMENTS to reset the time.

HEAT ELEMENT SOLID STATE RELAY

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

1. Remove the top cover from the control housing.
2. Remove the back panel from the housing.
3. Remove the remaining section of the control panel housing.
4. Identify and disconnect wires from relay.
5. Loosen or remove screw(s) as necessary and remove relay.

NOTE: If replacement relay does not include heat sink, remove heat sink from old relay and install on replacement. Use thermal compound Part No. 519504 between relay and heat sink if compound was used on old part.

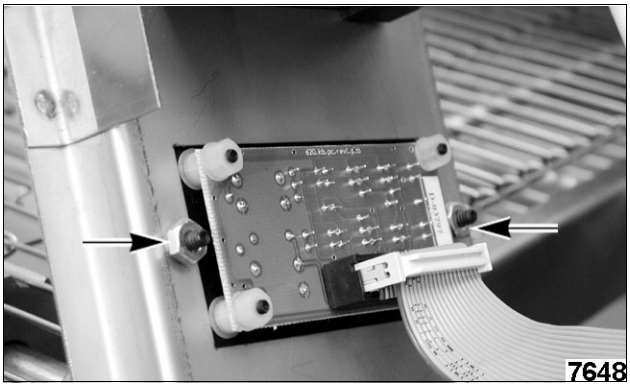


6. Reverse the procedure to install.

SPEED CONTROL BOARD

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

1. Remove the top cover from the control housing.
2. Remove the back panel from the housing.
3. Remove the remaining section of the control panel housing.
4. Unplug cable from board.
5. Remove nuts securing assembly.



6. Reverse the procedure to install.

SERVICE PROCEDURES AND ADJUSTMENTS

WARNING: CERTAIN PROCEDURES IN THIS SECTION REQUIRE ELECTRICAL TEST OR MEASUREMENTS WHILE POWER IS APPLIED TO THE MACHINE. EXERCISE EXTREME CAUTION AT ALL TIMES. IF TEST POINTS ARE NOT EASILY ACCESSIBLE, DISCONNECT POWER AND FOLLOW LOCKOUT / TAGOUT PROCEDURES, ATTACH TEST EQUIPMENT AND REAPPLY POWER TO TEST.

HEAT ELEMENT TEST

1. Access heat elements as outlined in REMOVAL AND REPLACEMENT OF PARTS.
2. Disconnect wires to individual elements and test according to chart at room temperature.

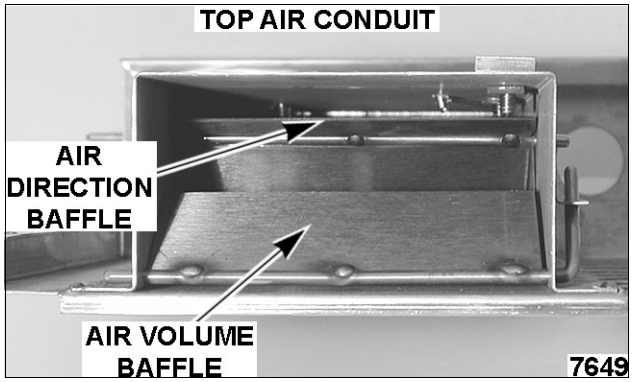
VOLTAGE	WATTAGE	RESISTANCE
208	3.5KW	12.3
208	4.5KW	9.6
240	4.5KW	12.8
480	3.5KW	68

AIR DISTRIBUTION ADJUSTMENT

1. Disconnect power.
2. Remove the air distribution panel that needs adjusted as outlined in AIR DISTRIBUTION PANELS.
3. Adjust the panels as outlined below under TOP PANEL and BOTTOM PANEL.
4. Reverse procedure to install.

Top Panel

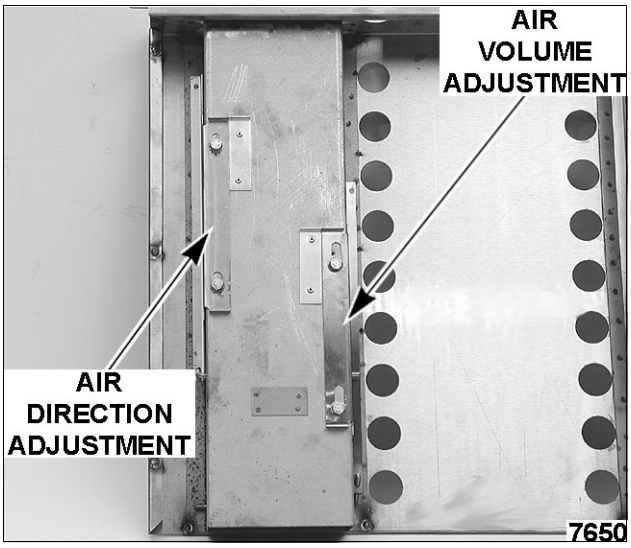
1. If baking is even, but more or less air is required on the top of the product.
   A. Adjust the air volume.
   B. Move the bracket to adjust the baffle. Adjust the left and right conduits the same.

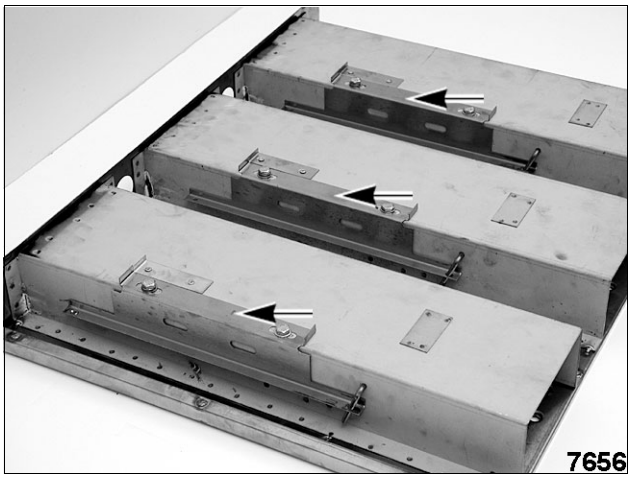


2. If cooking is not even, adjust the air directional baffle as needed.

Bottom Panel

1. If baking is even, but more or less air is required on the bottom of the product.
   A. Adjust the baffles as needed.

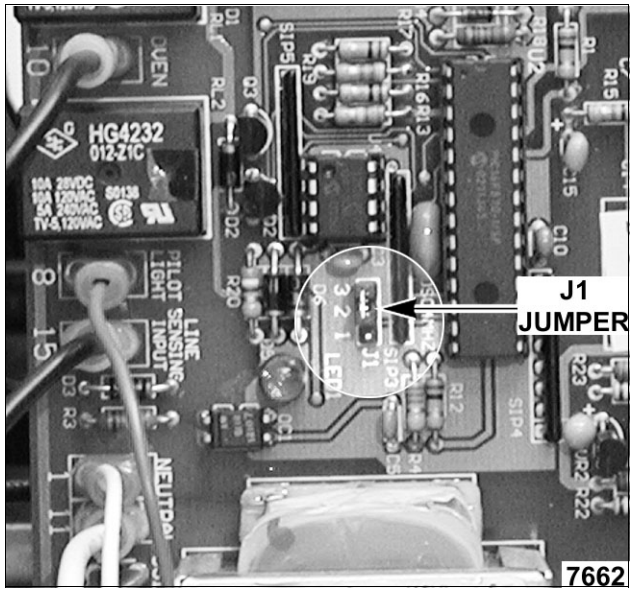




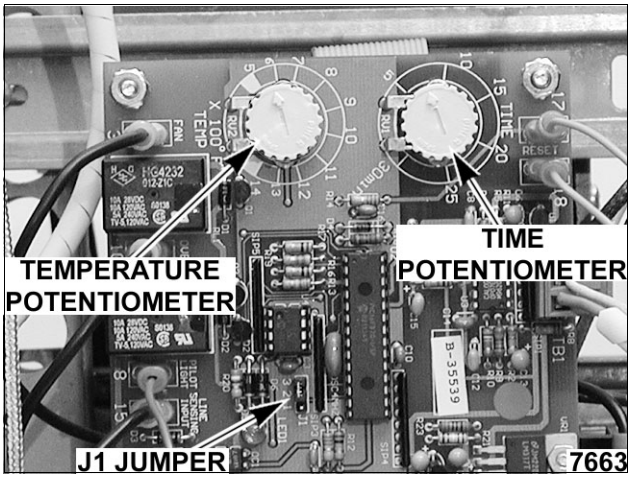
HIGH LIMIT CONTROL POTENTIOMETER SETTING

WARNING: DISCONNECT THE ELECTRICAL POWER TO THE MACHINE AND FOLLOW LOCKOUT / TAGOUT PROCEDURES.

1. Remove the top cover from the control housing.
2. Remove the back panel from the housing.
3. Remove the remaining section of the control panel housing.
4. Install jumper J1 in position 1-2.



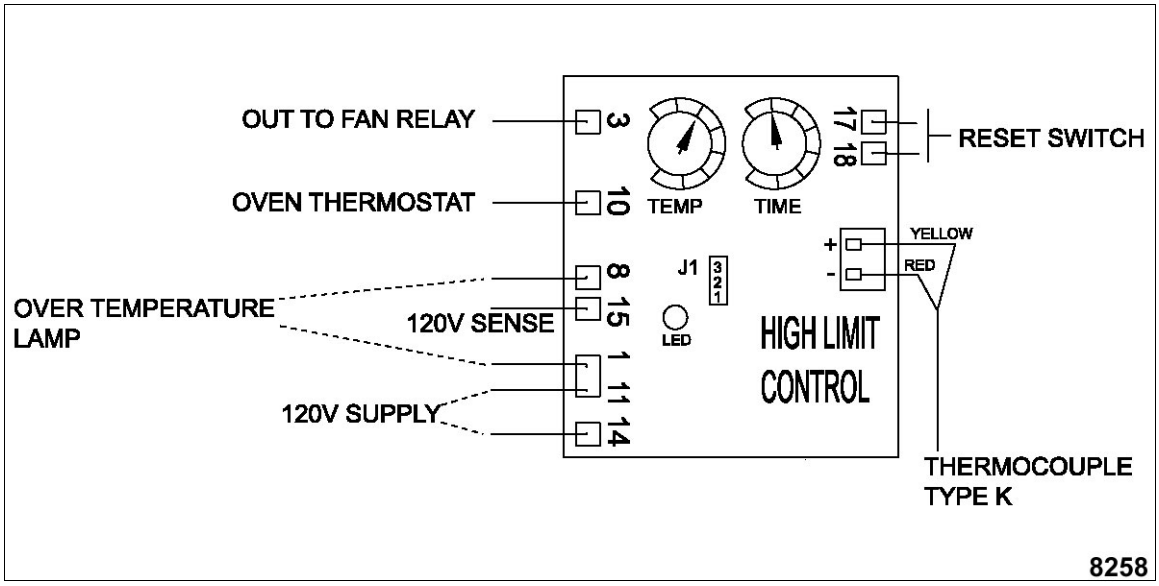
5. Set the temperature potentiometer to point to approximately 653 (653°F).
6. Set time potentiometer to point to approximately 5 minutes or whatever time customer may want to run blower after high limit trips.



7. Apply power.
8. With the oven temperature less than the minimum (500F) temperature potentiometer setting, the system should not trip.
9. Set the jumper J1 to position 2-3 to store the values. The potentiometers are now inactive. If values must be changed, temporarily return the jumper to position 1-2.

ELECTRICAL OPERATION

HIGH LIMIT CONTROL DIAGRAM



High Limit Control Operation

The high limit control is used in conjunction with the conveyor oven to provide the following functions.

- Over temperature protection of the oven, in the event of failure of the primary temperature control system.

- Maintained main blower operation after shutdown, for a timed set period.

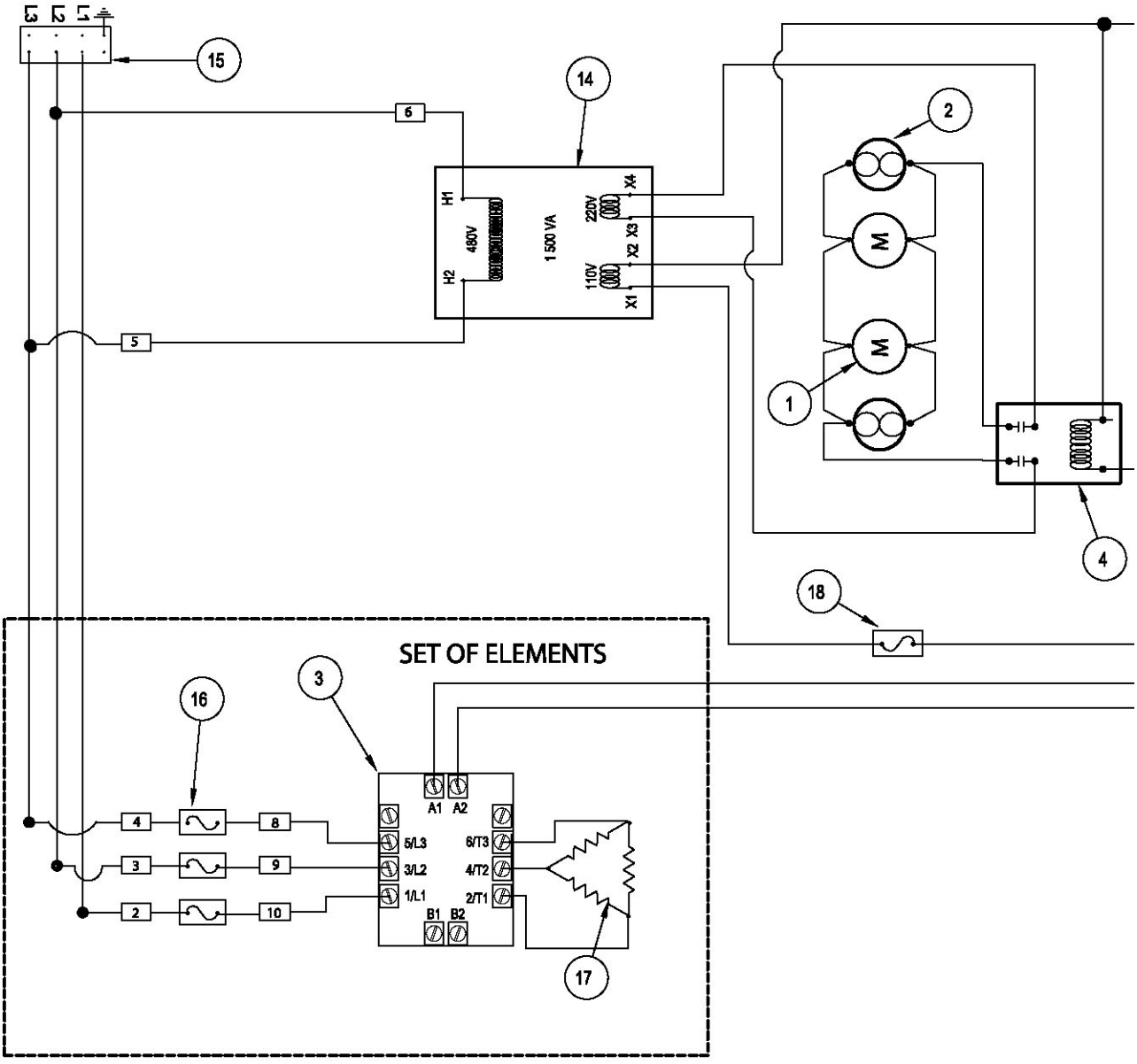
The high limit control incorporates two microprocessors, a thermocouple signal amplifier, and two trimmers that are used to set the maximum temperature (trip point) and the fan run-on time. The trip point can be set only when an on-board jumper is in the correct position. The temperature setting is saved in non-volatile memory (EEPROM). Once the jumper is moved, the setting is protected against tampering. The main microprocessor receives the amplified temperature signal from the remote type K thermocouple. It compares this value with the parameter value from the trimmer or from the internal EEPROM, (depending on jumper J1 position).

If the measured temperature value is greater than the set point, the microprocessor switches off the heat, turns on the over-temperature neon lamp on the operator panel and closes a contact in the fan circuit, to keep main blower active for the set period.

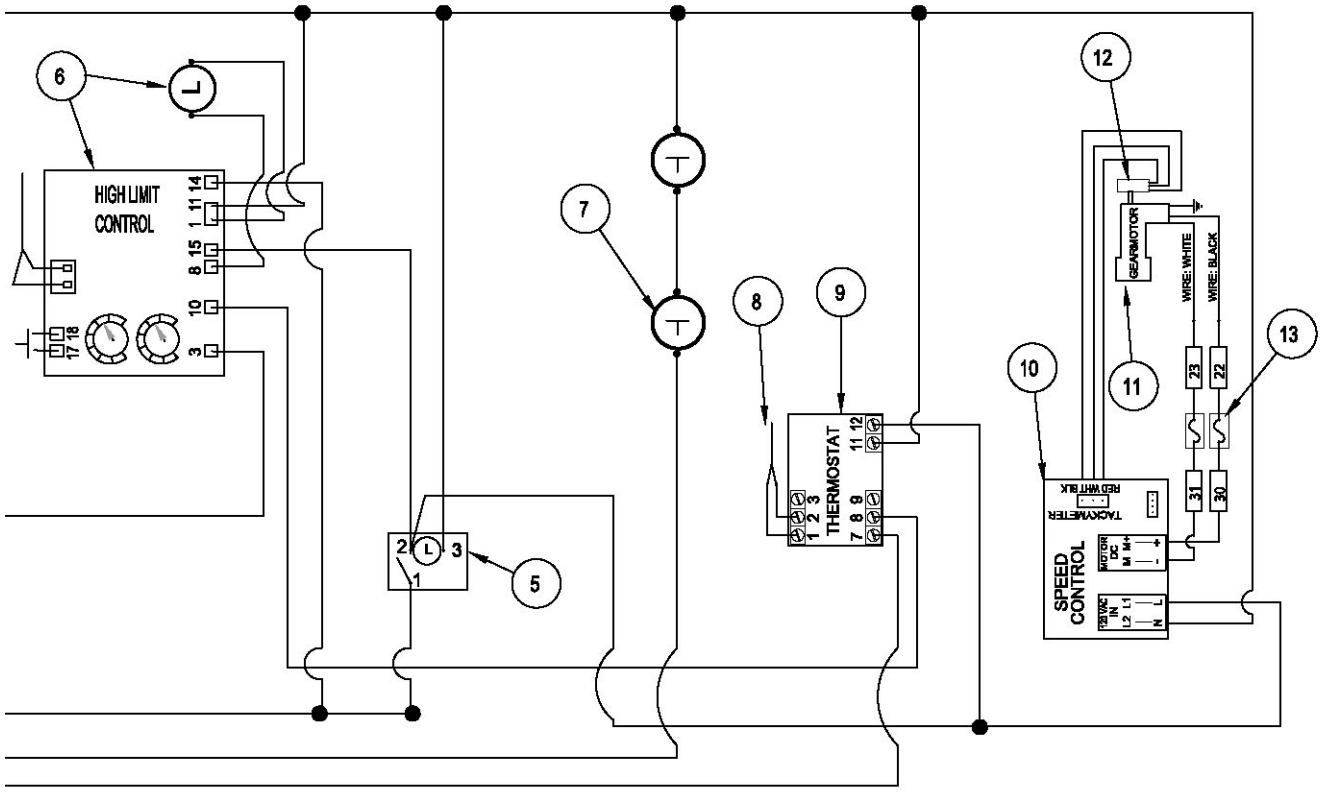
The heat circuit remains open until the temperature has dropped, and the Reset is pressed. A second microprocessor performs checking routines on the main circuit, and will trip the system if there is an apparent component failure or anomaly.

ELECTRICAL DIAGRAM

Models VEC3018, 4018 480 Volt - 3 Phase



MODELS VEC3018, 4018 480 VOLTS - 3 PHASE 1 of 2 8262



No.	Qty	REFERENCE	No.	Qty	REFERENCE
1	2	MOTOR BLOWER	11	1	MOTOR DRIVE FOR CONVEYOR
2	2	FAN 230V AXIAL (290 CFM)	12	1	TACHOMETER
3	1	RELAY - 55 AMPS	13	2	FUSE 1 AMP (DRIVE MOTOR)
-	1	HEAT SINK ASSEMBLY	-	2	FUSE HOLDER (SM GLASS FUSES)
4	1	RELAY - 20 AMPS	14	1	TRANSFORMER 480V - 220/110V
-	1	HEAT SINK ASSEMBLY	15	1	TERMINAL BLOCK (ONLY FOR 3018/4018)
5	1	SWITCH ON/OFF	-		
6	1	HIGH LIMIT CONTROL	16	3	FUSE HOLDER (SINGLE POLE)
7	2	DISC LIMIT CONTROL	-	3	FUSE 50 AMP
8	1	THERMOCOUPLE "K"	17	3	ELEMENTS 480V, 4.5KW
9	1	THERMOSTAT	18	1	FUSE HOLDER (FOR 25 AMP FUSES)
10	1	SPEED BOARD	-	1	FUSE 25 AMP (MAIN POWER LINE)

MODELS VEC3018, 4018 480 VOLTS - 3 PHASE 2 of 2

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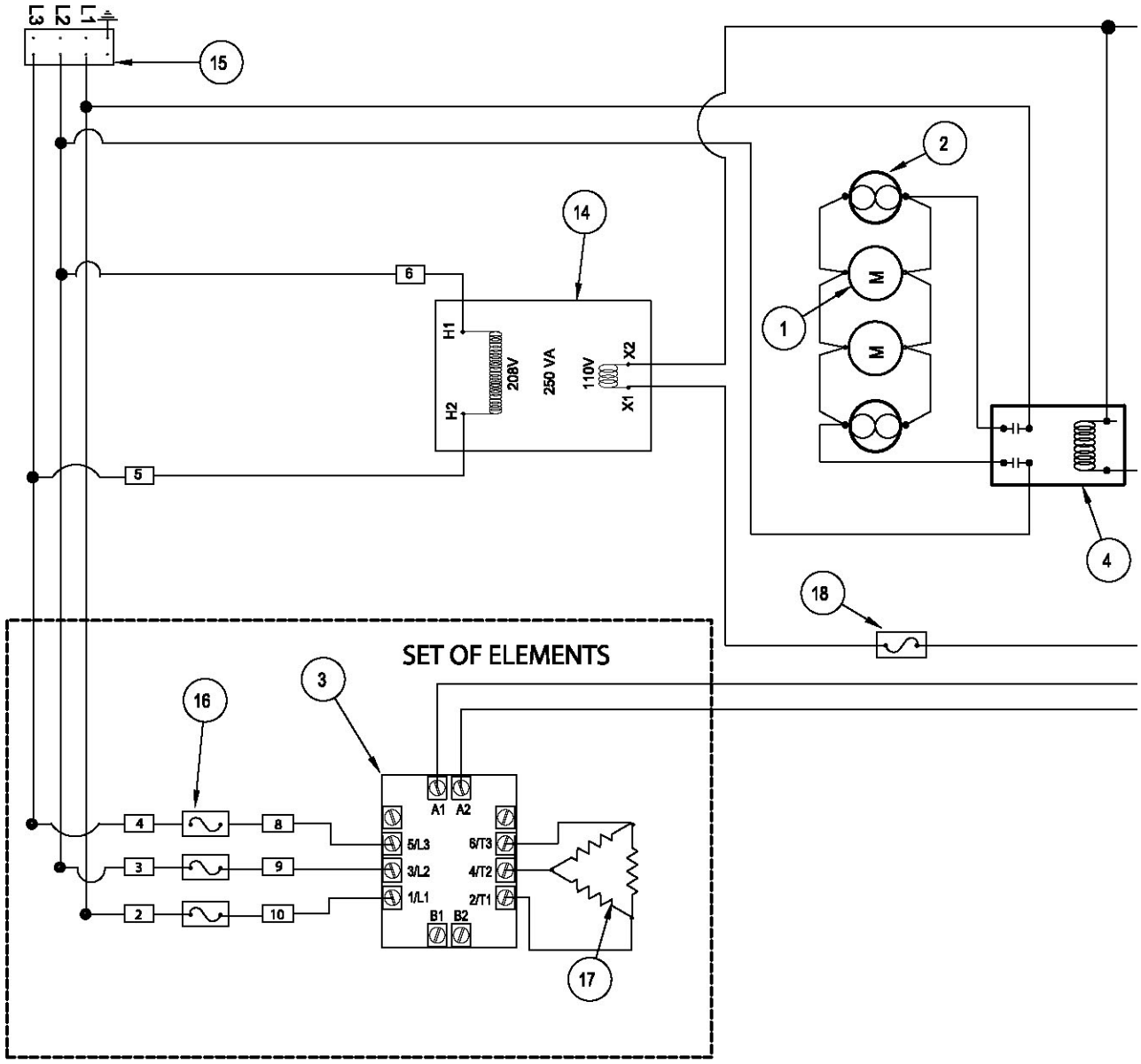
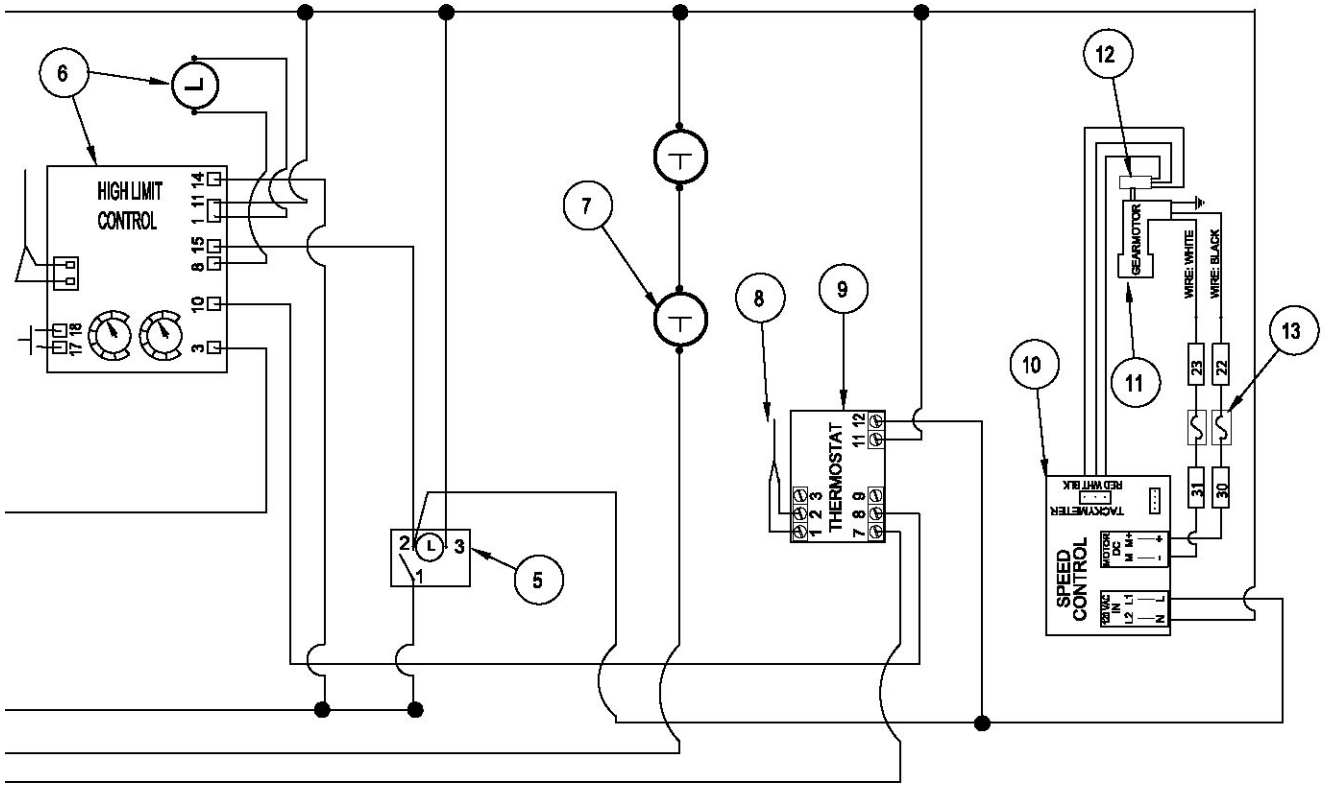
Models VEC3018, 4018 208 Volt - 3 Phase



MODELS VEC3018, 4018 208 VOLTS - 3 PHASE 1 of 2 8264



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1	2	MOTOR BLOWER	11	1	MOTOR DRIVE FOR CONVEYOR
2	2	FAN 230V AXIAL (290 CFM)	12	1	TACHOMETER
3	1	RELAY - 55 AMPS	13	2	FUSE 1 AMP (DRIVE MOTOR)
-	1	HEAT SINK ASSEMBLY	-	2	FUSE HOLDER (SM GLASS FUSES)
4	1	RELAY - 20 AMPS	14	1	TRANSFORMER 208V - 110V
-	1	HEAT SINK ASSEMBLY	15	1	TERMINAL BLOCK (ONLY FOR 3018/4018)
5	1	SWITCH ON/OFF	-		
6	1	HIGH LIMIT CONTROL	16	3	FUSE HOLDER (SINGLE POLE)
7	2	DISC LIMIT CONTROL	-	3	FUSE 50 AMP
8	1	THERMOCOUPLE "K"	17	3	ELEMENTS 208V, 4.5KW
9	1	THERMOSTAT	18	1	FUSE HOLDER (FOR 25 AMP FUSES)
10	1	SPEED BOARD	-	1	FUSE 25 AMP (MAIN POWER LINE)

MODELS VEC3018, 4018 208 VOLTS - 3 PHASE 2 of 2

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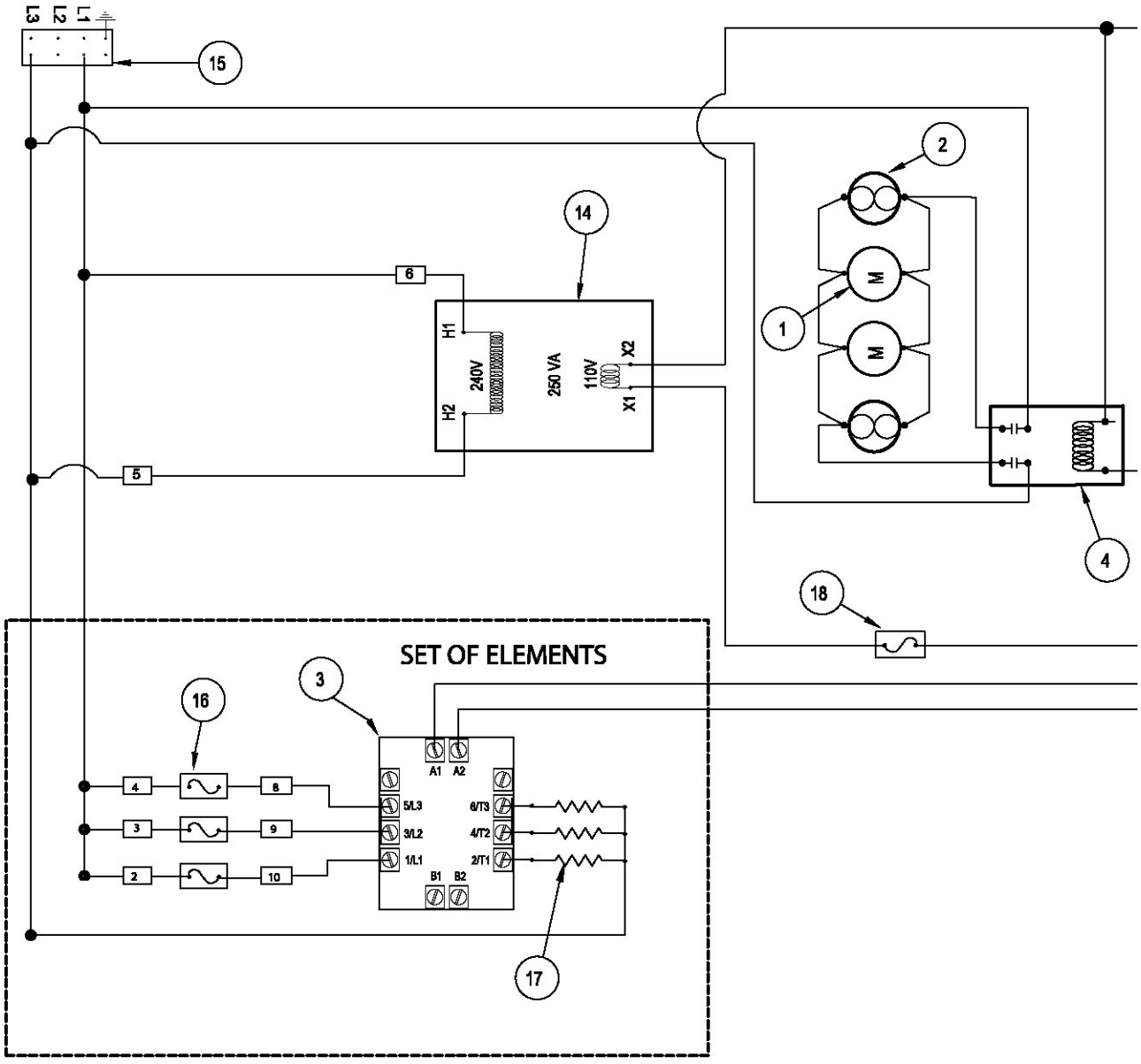
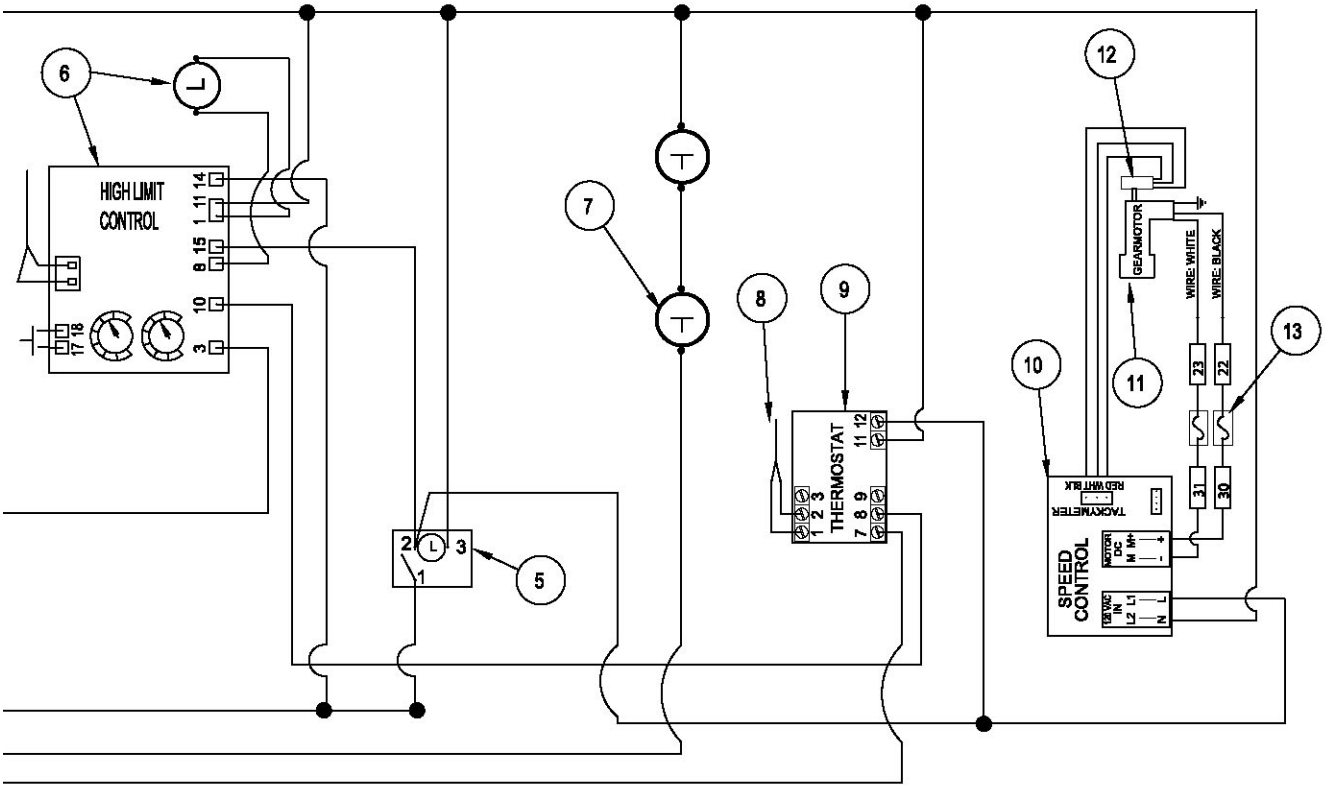
Models VEC3018, 4018 240 Volt - 1 Phase



MODELS VEC3018, 4018 240 VOLTS - 1 PHASE 1 of 2 8266



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3	1	RELAY - 55 AMPS	13	2	FUSE 1 AMP (DRIVE MOTOR)
-	1	HEAT SINK ASSEMBLY	-	2	FUSE HOLDER (SM GLASS FUSES)
4	1	RELAY - 20 AMPS	14	1	TRANSFORMER 220V, 230V, 240V
-	1	HEAT SINK ASSEMBLY	15	1	TERMINAL BLOCK (ONLY FOR 3018/4018)
5	1	SWITCH ON/OFF	-		
6	1	HIGH LIMIT CONTROL	16	3	FUSE HOLDER (SINGLE POLE)
7	2	DISC LIMIT CONTROL	-	3	FUSE 50 AMP
8	1	THERMOCOUPLE "K"	17	3	ELEMENTS 240V, 4.5KW
9	1	THERMOSTAT	18	1	FUSE HOLDER (FOR 25 AMP FUSES)
10	1	SPEED BOARD	-	1	FUSE 25 AMP (MAIN POWER LINE)

MODELS VEC3018, 4018 240 VOLTS - 1 PHASE 2 of 2

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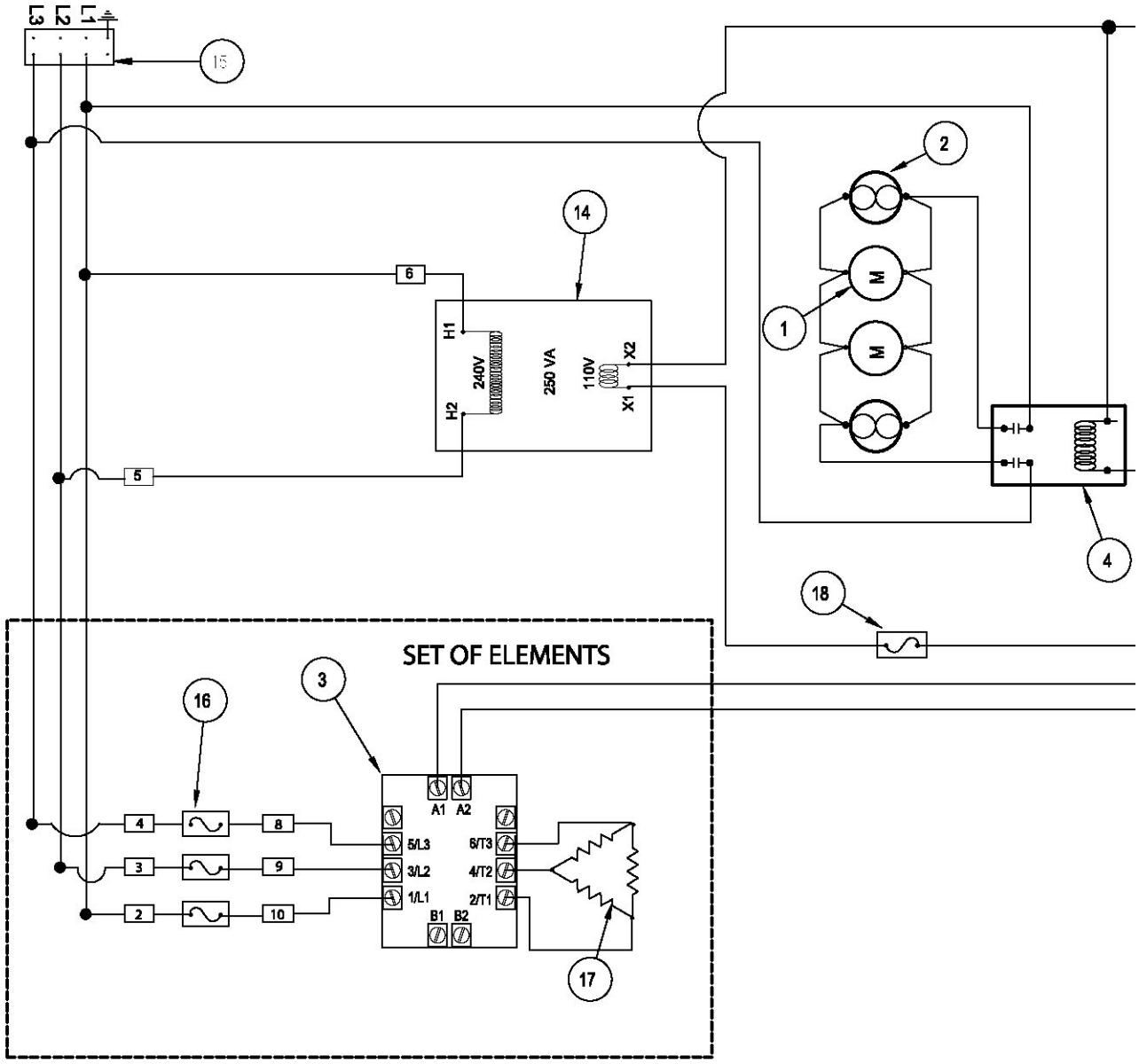
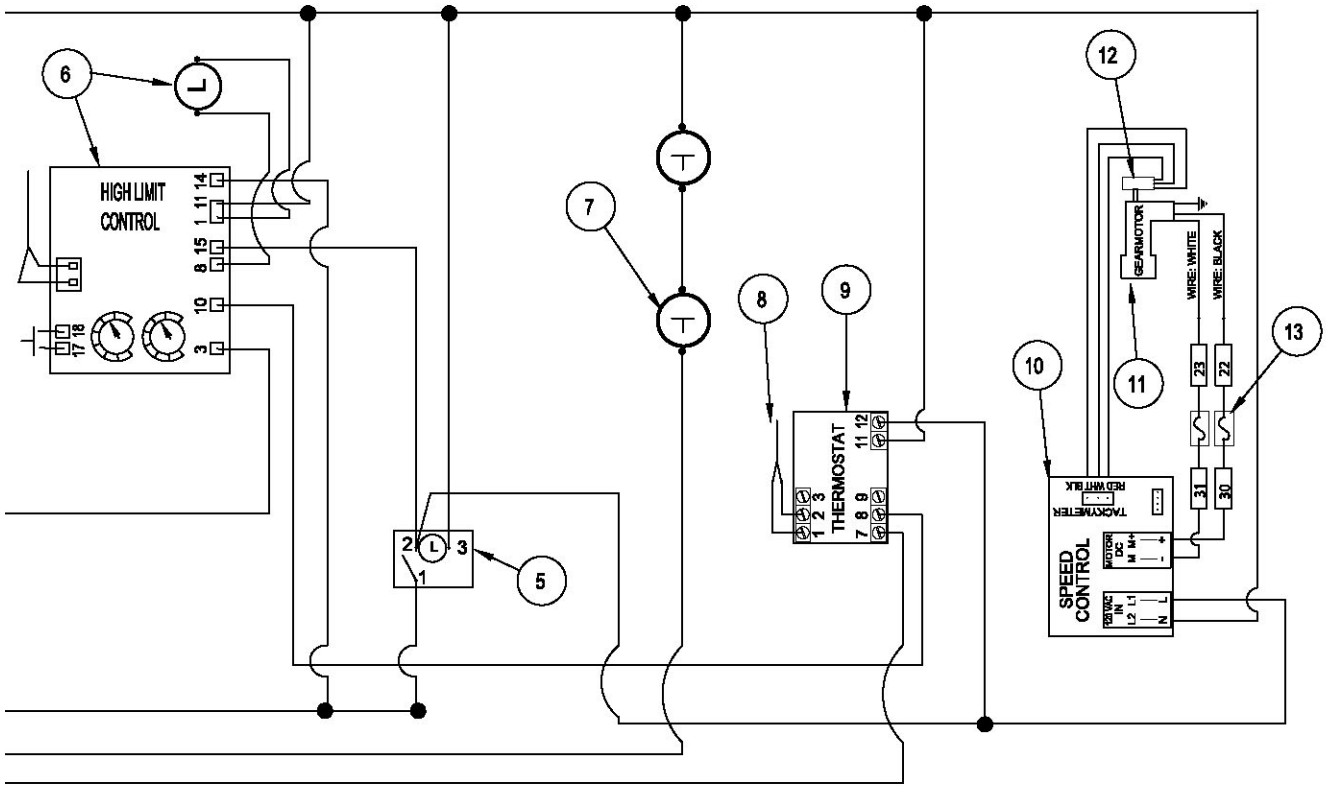
Models VEC3018, 4018 240 Volt - 3 Phase



MODELS VEC3018, 4018 240 VOLTS - 3 PHASE 1 of 2 8268



No.	Qty	REFERENCE	No.	Qty	REFERENCE
1	2	MOTOR BLOWER	11	1	MOTOR DRIVE FOR CONVEYOR
2	2	FAN 230V AXIAL (290 CFM)	12	1	TACHOMETER
3	1	RELAY - 55 AMPS	13	2	FUSE 1 AMP (DRIVE MOTOR)
-	1	HEAT SINK ASSEMBLY	-	2	FUSE HOLDER (SM GLASS FUSES)
4	1	RELAY - 20 AMPS	14	1	TRANSFORMER 220V, 230V, 240V, 440V
-	1	HEAT SINK ASSEMBLY	15	1	TERMINAL BLOCK (ONLY FOR 3018/4018)
5	1	SWITCH ON/OFF	-		
6	1	HIGH LIMIT CONTROL	16	3	FUSE HOLDER (SINGLE POLE)
7	2	DISC LIMIT CONTROL	-	3	FUSE 50 AMP
8	1	THERMOCOUPLE "K"	17	3	ELEMENTS 240V, 4.5KW
9	1	THERMOSTAT	18	1	FUSE HOLDER (FOR 25 AMP FUSES)
10	1	SPEED BOARD	-	1	FUSE 25 AMP (MAIN POWER LINE)

MODELS VEC3018, 4018 240 VOLTS - 3 PHASE 2 of 2

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TROUBLESHOOTING

High Limit Control

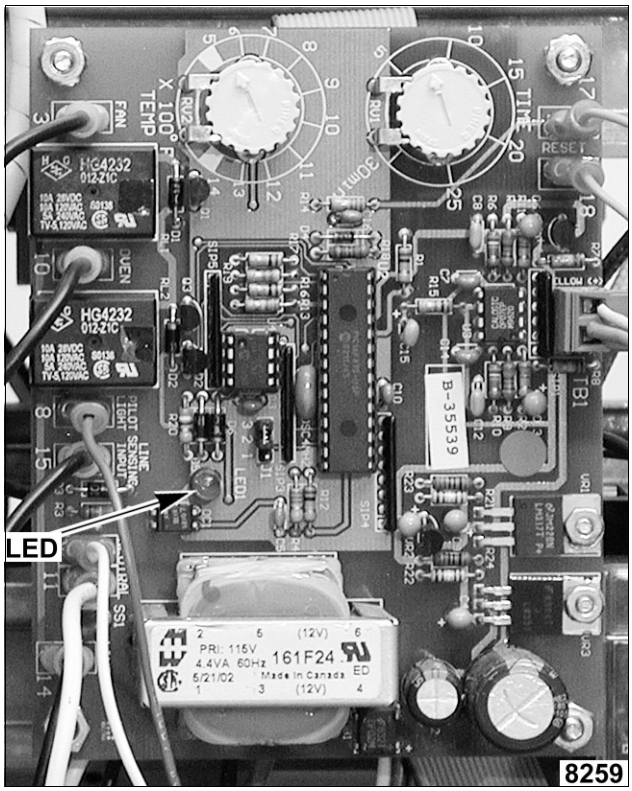
The circuit is self-checking with respect to hardware faults. An LED on the PCB lights if such a fault is detected. This will cause the unit to trip and the oven to turn off. In the event of an unusual trip, always check the LED. Some causes for fault indication are:

- Thermocouple failure

- Thermocouple amplifier failure

- Driver transistor failure

In this event, either the thermocouple must be replaced, or the high limit control replaced.



- NOTES -

CONDENSED SPARE PARTS LIST

QUANTITY	PART NUMBER	DESCRIPTION	NOTE*
1	425058-1	Temperature controller	X
1	427766-1	Speed control board	X
1	425059-1	Temperature probe	X
1	855341-7	High limit control / time delay	XX
1	855341-9	Temperature probe, high limit	
1	855341-10	Reset button, high limit	
1	425052-1	Blower motor	X
1	426464-1	Cooling fan	X
1	427037-1	Belt drive gear motor	X
1	425451-1	On/off switch	X
1	425501-1	DC power supply	X
2	FE-022-29	1 amp fuse	X
1	426394-1	2 amp fuse	X
1	425671-1	20 amp fuse	X
1	425538-1	25 amp fuse	X
2	425675-1	50 amp fuse	X
1	855341-8	Solid state relay, heat	
1	425503-1	Solid state relay, blower	X
AR	855431-1	Element 3.4kw 208v	
AR	855431-2	Element 5kw 208v	
AR	855431-3	Element 3.4kw 220v	
AR	855431-4	Element 5kw 220v	
AR	855431-5	Element 3.4kw 240v	
AR	855431-6	Element 5kw 240v	
1	425507-1	Transformer 208/110v	X

*NOTES XX = Includes board, thermocouple, reset button and light

X = Common to previous ML's